

WEB-BASED COMMON USE TERMINAL
WITH MULTIPLE APPLICATION SERVERS

Claim of Priority

[0001] This application is a Non-Provisional application including the subject matter and claiming the priority date under 35 U.S.C. §119(e) of Provisional Application Serial No. 60/278,656, filed on March 21, 2001, the contents of which are meant to be incorporated herein by reference.

Cross Reference To Related Application

[0002] This application is related to Non-Provisional application U.S. Serial No. 09/817,375, entitled "Item Delivery And Retrieval System", filed in the names of David J. Tilles et al. on March 27, 2001, which claims priority of Provisional Application Serial No. 60/220,842, filed on July 26, 2000 and Provisional Application 60/265,875, filed on February 5, 2001. This application is also assigned to the assignee of the subject application. The contents of this related application is also meant to be specifically incorporated herein by reference.

Background of the Invention

Field of the Invention

[0003] This invention relates generally to a digital computer system including a browser based terminal for executing multiple applications and, more particularly, to a web-page based common use interface for hosting multiple independent software applications on the same hardware platform.

Description of Related Art

[0004] Internet type systems linking one or more software programs called web browsers residing in a digital computer or platform and one

or more software programs called servers for implementing one or more specific functions called applications is generally well known. A browser is a client program that typically uses the Hypertext Transfer Protocol to make requests of web server(s) throughout the Internet on behalf of the browser. A server, on the other hand, is a program that fulfills the request of a client program of a browser.

[0005] In such an environment, various types of tasks or applications are known to have been implemented for supporting a variety of services , for example, ATM transactions, point-of-sale transactions and the dispensing of postage.

[0006] In the above-referenced related application U.S. Serial No. 09/817,375, entitled "Item Delivery And Retrieval System" there is disclosed a secure item and delivery/return (IDRS) system which permits a user such as a customer to retrieve undelivered items or return items at a specified location without human intervention on demand. Typically, a customer receives some type of notification that an undeliverable item is stored at a remote location where there is located an item delivery retrieval system which includes apparatus for holding one or more items. When it is convenient, the customer subsequently travels to the location of the system and retrieves the items.

[0007] The aforesaid IDRS system includes a storage sub-system and a computer sub-system. The storage sub-system provides an item storage and delivery environment including a secure enclosure having an item storage carousel including control apparatus as well as a set of sensors. A computer sub-system is embodied in a user access terminal, such as a kiosk, which hosts web-page based customize application software for implementing an application interface of selectively configurable application interface controls for providing user access to the carousel via one or more storage bins located behind a set of normally closed doors which are selectively opened and then closed for items storage and retrieval, provides access control to the bins, and

manages the location of items in the storage sub-system. The doors are open when proper identification is provided by user so as to permit access only to specified designated bin locations.

[0008] The system also includes web browser software which interfaces with one or more servers over the internet to exchange data, retrieve documents, and display web pages. In addition to browser software residing in the user access terminal, the terminal also includes a screen which may be a touch screen as well as other option devices such as a bar code reader, credit/debit card reader, pin pad, printer, signature pad, and one or more security cameras.

Summary

[0009] Accordingly, it is an object of the present invention to provide a web-page based common use interface which hosts multiple, independent software applications on the same hardware platform.

[0010] It is a further object of the invention to provide a self-service user access terminal which operates in a shared common use environment.

[0011] It is another object of the invention to provide a common use shared browser device which can execute multiple applications while using the same peripheral devices.

[0012] It is still another object of the invention to provide a self-service user access terminal in the form of a kiosk of an item delivery and retrieval system which hosts multiple independent software applications while sharing the same peripheral devices.

[0013] These and other objects are achieved by a web-page based common use interface embodied in and executed on a platform such as an item delivery and retrieval system including browser software located in a common use access terminal which executes multiple independent software applications with the multiple applications running on respective server programs, including multiple package servers from discrete delivery service providers. In a preferred embodiment, four

discrete applications including, but not limited to, package pick-up, package exchange, buying postage, and club type delivery and pick-up of discrete items, are hosted while using the same system hardware. Each application is launched from a main touch screen of the common use access terminal which, in the aforesaid item delivery and retrieval system, is in the form of a kiosk. Upon selection of one of the four applications, the selected application web server program takes control of the system and its peripherals for the balance of the particular session. During a session, no other server can use the kiosk or its peripherals, nor can any other user interact with another server. At the conclusion of the execution of the application, common use software in the kiosk clears all sensitive data where necessary so that another user cannot retrieve the data.

[0014] Further scope of applicability of the present invention will become apparent from the detailed description provided hereinafter. It should be understood, however, that the detailed description and specific examples, while disclosing the preferred embodiment and applications executed in accordance with the invention, they are provided by way of illustration only, since various changes and modifications within the spirit and scope of the invention will become apparent to those skilled in the art.

[0015] Brief Description of the Drawings

[0016] The present invention will become more fully understood from the detailed description provided hereinafter, when considered together with the accompanying drawings which are provided by way of illustration only, and wherein:

[0017] Figure 1 is a block diagram illustrative of the system architecture of an item delivery and retrieval system comprising the hardware platform in accordance with the subject invention which hosts multiple, independent software applications;

[0018] Figure 2 is an end elevational view generally illustrative of a vertical carousel and kiosk shown in Figure 1;

[0019] Figure 3 is a front elevational view of the vertical carousel shown in Figure 1 further depicting a kiosk mounted on the front thereof, as well as a plurality of access doors therefor;

[0020] Figure 4 is a front elevational view further illustrative of the kiosk shown in Figures 2 and 3;

[0021] Figure 5 is a system block diagram illustrative of the inventive concept of the subject invention wherein a common use terminal shares peripherals with four discrete service provider server applications;

[0022] Figure 6 is illustrative of a flow diagram of a package pick-up application executed in accordance with the subject invention by one server applications shown in Figure 5;

[0023] Figure 8 is a flow chart illustrative of a postage purchase application executed in accordance with the subject invention by another server application shown in Figure 5;

[0024] Figure 9 is illustrative of a flow chart of a package exchange application executed by yet another server application shown in Figure 5; and

[0025] Figure 10 is a flow chart illustrative of a Club Type application executed by still another server application shown in Figure 5.

[0026] Detailed Description of the Invention

[0027] Referring now to Figure 1, shown thereat is a block diagram partially illustrative of the web enabled item storage and retrieval system shown and disclosed in the above referenced related application, U.S. Serial No. 09/817,375, which is incorporated herein in its entirety for illustrating the preferred embodiment of a common use hardware platform for hosting multiple independent software applications which will be described hereinafter.

[0028] Figure 1, moreover, is illustrative of the architecture for an item and delivery retrieval system (IDRS) 10 including, among other things, a storage sub-system 12 and a computer sub-system 14. The computer sub-system 14 includes computer apparatus having software, such as browser software 16, also referred to simply as a browser, and which is internet web-page based. The browser software 16 resides in a user access terminal in the form of a kiosk 18 having a screen 20 which includes a touch selection mode for selection of an application to be subsequently described.

[0029] The kiosk 18 is shown in Figures 2 and 3 mounted on the front of a vertical carousel 22 which includes multiple bins, not shown, and which are accessible via an arrangement of access doors 24. Access to the carousel 22 is provided by way of the kiosk 18 through a carousel controller and sensor sub-system 26 via a control bus 27. Peripheral devices are also associated with the kiosk 18, and includes, among other things, a magnetic card reader 28, a printer 30, a PIN number pad 32, a bar code reader 34, and a signature pad 36, also, one or more user observation cameras 38.

[0030] Further as shown in Figure 1, a master server 40 supports and stores set(s) of web pages 42 which are connected directly to the browser software of the kiosk 18 by way of a direct connection signal path 43 through the internet (or, when desirable, intranet) 44 or a dial-up connection via signal path 45 including a modem 46. A web server 48 including sets of web pages 50, is also shown connected back to the master server 40 either by way of a direct internet connection via signal path 49 or a dial-up connection through internet 44 via signal path 51 and modem 52. Web server 48 is also connected to the browser software 16 of the kiosk 18 by way of a direct signal path 53 connected to the signal bus 41 or a dial-up connection by way of a signal path 54 and a modem 55.

[0031] The master server 40 includes a centralized data base for the IDRS system 10 for storing, among other things, data including user e-mail addresses, user account/or loyalty card information, item status, and other information needed to operate the IDRS system 10 and, when desirable, one or more application programs which reside in the web pages 42. The web server 48 is shown comprising a single web server, but, when desirable, may be comprised of a multiplicity of web servers, each including web pages for storing one or more specific application program depending upon the needs of the user. To enhance performance in the preferred embodiment of the subject invention, web pages for one or more specific application programs as shown by reference number 57 may be stored in the kiosk 18. and are displayable, on demand, on the screen 20.

[0032] The foregoing has been presented as background information for understanding the inventive concept which is now to be described. A more detailed description and understanding of the IDRS system 10 can be obtained by reference to the above-referenced related application U.S. Serial No. 09/817,375.

[0033] Considering now Figures 5-10, Figure 5 depicts a block diagram of the subject invention wherein multiple discrete applications are executed on the same hardware platform, i.e., the kiosk 18 of the IDRS system 10 shown in Figure 1. The browser 16 residing in the kiosk 18 hosts multiple applications running on multiple server software residing in either the web pages 42 of the master server 40, web pages 50 of the web server 48, or the web pages 57 of the kiosk 18. As shown in Figure 5, four (4) discrete applications are hosted by the browser 16. The applications are run on individual server software programs as shown by reference numerals 56, 58, 60 and 62. In the preferred embodiment of the subject invention, all four of the server programs 56, 58, 60 and 62 reside in the web pages 50 of the web server 48.

[0034] The first server application 56 is a "package pick up" application which implements package pick-up service based on connection across the network operating on a server program in the web pages 50 of the web server 48 linked to a package tracking number that may be contained in a bar code identifier on a package which resides in the carousel 22. Typically, the package is being stored after unsuccessful delivery on the part of a delivery service.

[0035] The second server application 58 comprises an electronic "Buy Postage" application including electron stamp printing. In this application which resides in the web pages 50 of the web server 48, the server 58 does not require the use of the IDRS carousel 22, but only the peripherals surrounding the kiosk 18.

[0036] The third server application 60 comprises a "Package Exchange" application residing in the web pages 50 of the web server for networked devices used for unattended exchange of packages using PIN numbers via the PIN pad 32 at the kiosk 18.

[0037] The fourth server application 62 comprises a "Club Type Delivery and Pick Up" application included in the web pages 50 of the web servers requiring a loyalty card and a form of membership to access the carousel 22 and may operate stand alone without a network connection.

[0038] It should be noted that server applications 56, 60 and 62 all share the same carousel real estate in an individual secure manner. Although four applications are shown and described, any number of applications more or less than four, such as only one application could be implemented when desired. Whatever the number, each application shown in Figure 5 is launched or entered from the kiosk 18 via touch selection of the screen 20.

[0039] Upon selection of any one of the four applications shown in Figure 6, the server software 56, 58, 60 and 62 (Figure 5) of the selected application takes control of the system 10 including the peripheral

devices for the balance of the session. The software server of each application allows only that server to control the peripherals through the use of ActiveX Control type drivers shown and described for example in related application U.S. Serial No. 09/817,375.

[0040] ActiveX control is well known in the art of digital computer technology. It is a programming language including a set of rules for how applications should share information and can be automatically downloaded from a server, e.g. the web server 48 (Figure 1) and executed or run, for example, by the web browser 16 located in the kiosk 18. ActiveX controls have full access to an operating system in the subject invention using web pages from the server 48 and are used to implement specific control functions as will be described hereinafter.

[0041] When the "Buy Postage" icon 66, for example, is selected from the main touch screen 20 shown in Figure 6, the browser software 16 of the kiosk 18 goes to the web server 48 across the internet 44, forms a secure connection either by the direct signal path 53 or by way of the dial-up connection involving signal path 54 and the modem 55, and then allows that server software 58 to use ActiveX control at the kiosk 18 to use the card swipe peripheral 28 to read information from a credit card, for example, which the browser 16 passes to the web server 48. After verification by the web server 48, ActiveX controls use the reserved kiosk peripheral, in this case the printer 30, to print bit maps of postage desired. Once the kiosk browser 16 has confirmed successful printing, the session with the user terminates and the kiosk 18 returns to the application's main page. Next, the ActiveX control portion of browser software 16 of the kiosk 18 permanently clears all sensitive data from the postage transaction from the kiosk memory, not shown, so that no other application can embed code to retrieve it. This feature provides an environment for multiple users and multiple applications to securely share the kiosk resources in a common use interface.

[0042] Once the "Buy Postage" application has been completed, the kiosk 18 including the browser 16 and its peripherals are available for another user with the same application or another application.

[0043] If the next user again selects the "Purchase Postage" application by pressing the "Buy Postage" icon 66, a totally new postage transaction is entered into with no way to compromise the security of trusted relationship between the postage server, the common used peripherals, and the first user. The second user establishes his/her own secure trusted relationship between kiosk 18, web server 48, and the kiosk's common use peripherals, e.g., the printer 30.

[0044] If, on the other hand, a user goes to the main screen 20 and selects an IDRS application to "Pick Up Packages" by pressing the icon 64 (Figure 6), the kiosk browser 16 establishes a new web based connection with the unique package service server software 56, shown in Figure 5 located in the web server 48. This package service server software now uses ActiveX control residing in the browser software 16 of kiosk 18 to take total control of the shared common used peripherals of the kiosk 18, including the card swipe device 28, printer 30, as well as control of the carousel 22 until completion of the transaction has been made by the user. During this session, no other server software, for example server software 58, 60 and 62, can use the kiosk 18 or its peripherals. Also, during each session such as in the "package exchange application", no server or user can access information about previous transactions on the kiosk 18. At the completion of the transaction, kiosk common use software permanently clears all sensitive data from the posted transaction from the kiosk memory so that no one can retrieve it.

[0045] Considering now the flow diagrams associated with the four applications described above, the flow chart shown in Figure 7 discloses the various steps involved in executing the "package pick up" application. As shown by step 72 following "start", a user selects the package pick-up application by pressing the icon 64 (Figure 6) on the

screen 20. Next, the "package pick-up" server software 56 uses an ActiveX control from the browser software 16 in the kiosk 18 to request tracking number information from the user as shown by step 74. Next, the user inputs a tracking number on the kiosk 18 via the bar code reader 34 or touch screen 20 via step 76. The package pick up server software 56 residing in the web server 48 validates the PIN information added, for example, by way of the PIN pad 32 per step 78. Following this, the package pick-up server 56 runs ActiveX controls on the kiosk 18 to open one or more of the carousel doors 24 (Figure 3) as shown by step 80. This is followed by step 82 in which the carousel 22 opens the door 24 containing the package including the tracking number. The server software 56 then receives a confirm pick-up command from the kiosk 18 per step 84, which is followed by step 86, whereupon the kiosk 18 returns to the application's main page on the screen 20. This is followed by step 88, whereupon the kiosk 18 ActiveX controls clears memory and returns to the top level screen as shown in Figure 6.

[0046] With reference to the "Purchase Postage" application, the flow chart shown in Figure 8 begins with the user selecting the purchase postage application by pressing icon 66 (Figure 6). In step 90, the server software 58 requests "information" from the magnetic card swipe device through ActiveX control at the kiosk 18 per step 92. Next, as shown by step 94, the user performs a magnetic card swipe at the kiosk 18 via the card reader 28. Next, the web server 48 validates credit information as shown by step 98, whereupon the server 48 executes ActiveX control at the kiosk 18 to print postage at the kiosk 18 per step 98. This is followed by the printer 30 at the kiosk printing postage as shown by step 100. The server software 58 next receives a print confirmation from the kiosk browser software 16 at step 102, whereupon the kiosk returns the application's main page per step 104, which is followed by the kiosk 18 again clearing the memory and returning to the top level screen of the touch screen 20, via step 106.

[0047] Considering now the "package exchange" application, reference is made to Figure 9 where the flow chart indicates that the user first selects the package exchange application as shown by step 108 by pressing the icon 68 shown in Figure 6. This is followed by the exchange server software 60 (Figure 5) residing in the web server 48, requesting a PIN ID number from the user via ActiveX control at the kiosk 18 per step 110. This is followed by step 112, whereupon the user inputs his/her PIN ID on the kiosk PIN pad 32 or by way of the touch screen 20. The exchange server software 60 then validates the PIN information in step 114, which is followed by the web server 48 using the kiosk 18 ActiveX controls to open the carousel door(s) 24 shown by step 116. One or more of the carousel doors 24 next opens, containing the package with PIN ID per step 118, where the package is retrieved or a return package is inserted in its place or a return package is simply inserted in the door for an exchange. This is followed by step 120, where the server software 60 receives a pick-up confirmation command from kiosk 18 at step 120, which is followed by step 122, where the kiosk 18 returns to the application's main screen and finally the kiosk clears memory and returns to the top level screen per step 124.

[0048] With respect to the fourth application termed "Club Type Delivery and Pick-Up", the user at step 126 selects the club type application via icon 70 of Figure 6. The server software 62 (Figure 5) residing in the web server 48 uses the ActiveX control at the kiosk 18 to request memory information from the magnetic card swipe device 28. The user then performs a magnetic card swipe operation as shown by step 130 at the card reader 28, whereupon the web server 48 validates memory information in accordance with step 132. Next, the server software 62 uses the kiosk's 18 ActiveX controls to open one or more of the doors 24 of the carousel 22, as shown by step 134. Following this, the carousel 22 opens a door containing the members package shown by step 136 which is followed by the web server 48 receiving a pick-up

confirmation command from the kiosk browser 16 software per step 138. Again, this is followed by the kiosk 18 returning to the applicant's main screen per step 140 which is followed by the step of clearing memory and returning to the top level screen 20 as shown by step 142.

[0049] Thus what has been shown and described is a self-service kiosk 18 operating in a shared common use environment with an item delivery and retrieval system 10 including a storage carousel 22. Common use shared browser software operates with multiple package service providers as well as a postage provider utilizing shared peripherals of the item delivery and retrieval system.

[0050] The foregoing detailed description merely illustrates the principles of the invention. It will thus be appreciated that those skilled in the art will be able to devise various arrangements, which although not explicitly described or shown herein, embody the principles of the invention and are thus within its spirit and scope.